Testimony of Jeffrey M. Bacidore regarding H.R 1053

I support H.R 1053 which would require tbe decimalization of U.S. exchanges. I agree with other supporters who argue that it will make price quotes simpler and will allow for more consistency with foreign equity markets and derivative markets. In the eye-s of many, this bill was "inevitable". However, I believe that tbe real benefit of this bill is that it is generating a debate on the minimum tick size. The American Stock Exchange has already approved a reduction in its minimum tick, and the NASDAQ is considering a similar move. Although I support the bii as written, I do not believe that a reduction in the minimum tick size should be mandated. Instead, I believe that the individual exchanges should be allowed to set their own post-decimalization tick sizes. Because I feel the real impact of this bii involves what changes in the minimum tick size, if any, are mandated, the bulk of my testimony will focus on tbe minimum tick size. I begin by discussing the arguments for and against a minimum tick size reduction.

*Pros and Cons of Reductions in the Minimum Tick Size*

Some feel that decimalization would benefit everyone. By reducing tbe minimum tick size, the bid-ask spread is permitted to get smaller, leading to a reduction in trading costs to investors. This reduction in trading costs should lead to an increase in trading volume. Liquidity providers (i e., those willing to buy/sell from investors) will lose money on each trade relative to before the minimum tick was reduced, as the bid-ask spread (i.e., what they earn for each round trip trade) declines. However. the increase in trading activity will compensate them for this decline in per share revenue. To see this, consider the following. A soft drink vendor sells soft drinks for $1.00 each and currently sells 100 drinks. Her revenue is therefore $100. If the vendor cots her price to SO.50 and the number of drinks she sells stays the same, she only earns $50. However, if the price. cut leads to more people wanting soft drinks, she may actually increase her revenue. If she now

sells 300 soft drinks, her revenue rises to $150. As in this example, volume must increase sufficiently to offset tbe reduction in per-share profits (i.e., the bid-ask spread). Otherwise, liquidity provider profits will decline. Proponents of a reduction in the minimum tick argue that the increase in trading volume will be sufficiently large and consequently "everyone wins". If this were, in fact, true, then wouldn't all the exchanges be pushing for an elimination of minimum tick rules?

As was mentioned above, the American Stock Exchange announced its desire to reduce its tick size by one-half, and tbe NASDAQ is considering a similar move. However, I am aware of no discussion to completely eliminate the minimum tick. Further, the New York Stock Exchange has not endorsed such a move. So tbe question is "Why would exchanges resist something that will make everyone better off?" To address this point, it is useful to consider the empirical evidence.

My recent study entitled "The Impact of Decimalization on Market Quality: An Empirical Investigation of the Toronto Stock Exchange" (Indiana University Working Paper #560) analyzed the impact decimalization had on market quality following the decimalization of Canadian equity markets on April 15, 1996. The Toronto Stock Exchange (TSE), along with the other equity exchanges in Canada, reduced the minimum tick size from one-eighth dollar to 5 cents for stocks trading above 65.00, and from 5 cents to 1 cent for stocks trading between $3 and $5. The main findings of my research are the following

Stocks Trading above $5.00 (minimum tick size reduced from one-eighth to 5 cents)

- Bid-ask spreads decreased significantly after decimalization.
- Quoted depths (i.e., the number of shares liquidity providers are willing to buy/sell at the best bid/ask) also declined significantly following decimalization. However, this is not necessarily evidence that liquidity has been adversely affected because of the concurrent decline in spreads

To see why, consider the case where soft drinks can be sold no cheaper than $1.00, but the competitive price is only $0.50. More people would be willing to sell soft drinks if the price was set at the artificially high price of $1.00. Let's say that there were 100 soft drinks available at $1.00. Thus, if you wanted to place a large order to buy soft drinks, 100 drinks would cost $100. However, when the price declines, less people would be willing to sell *at the new price*. So, lot's assume that when the price falls to $0.50, only 40 soft drinks can be purchased at $0.50. This does not necessarily mean that the market is worse. If you still wanted to buy 100 soft drioks, you may be able to boy 40 at the new SO.50 price and the remaining 60 at $1.00 (if the other 60 suppliers are still willing to sell soft drinks at $1.00) for a total of only $80. Applying tbis to equity markets, even if depth declines due to a reduction in the best bid-ask spread, large investors may still benefit. My study confirms this: although the depth available at the new lower spread is smaller, the effective cost of trading larger quantities declines (as was tbe case in the soft drink example), indicating that liquidity was not adversely impacted.

. Average daily trading volume in the period following the move to decimal pricing *declined* following decimalization, although not significantly from a statistical standpoint. This implies that liquidity providers were adversely affected because tbe decline in per-share profits was not offset by an increase in trading volume.

Stocks Trading between $3.00 and $5.00 (minimum tick reduced from 5 cents to one cent)

- Quoted spreads *increased while* quoted depths *decreased* following decimalization. This result is opposite of those predicted by decimalization proponents. As was the case for stocks priced greater than $5.00, trading volume declined (although not significantly).

The qualitative results for stocks trading above $5.00 are virtually identical to those found in an earlier study by Professors Heejoon Ahn, Charles Cao, and Hyuk Choe of the Pennsylvania State University ("Tick Size, Spread, and Volume," *Journal of Financial Intermediation* 5:2-22) which studied a reduction in the minimum tick on the American Stock Exchange. For stocks trading above $5.00, the gains to investors hypothesized by decimalization proponents were realized. However, volume did not increase, leaving liquidity providers worse off. It is tbis latter point which some feel explains the reluctance of exchanges to reduce their minimum tick size. Exchanges, they argue, act in tbe interest of its members, not the investing public necessarily, and therefore oppose a reduction in the minimum tick size in order to protect its members. Thus, although the investing public would be better off following decimalization, exchanges do not wish to impose losses on its members.

However, there are other explanations as to why exchanges may opt against reducing their tick sizes. The following are a few key examples.

- *Quote matching*: Professor Lawrence Harris of the University of Southern California argues that a reduction in the minimum tick size might have an adverse effect on liquidity because it will be easier for "quote matchers" to circumvent time priority. To show this, I will use the example provided by Professor Harris in his paper "Does a Large Minimum Price Variation Encourage Order Exposure?" (NYSE Working Paper #96-05). Professor Harris writes:

  > *"Suppose that a quote matcher knows that a large order to buy stock is at 20. If she con buy the stock before the large trader, she will acquire a valuable position in the stock. If stock values rise. she will profit to the full extent of the rise. If they fall, she may be able to bound her loss by selling to the large order at* 20."

  Quote matchers pay a cost to circumvent time priority, specifically, they must better tbe price by at least the minimum tick. By reducing the minimum tick size, quote matchers find it less costly to follow such strategies. Consequently, these large traders will display less of what

they are willing to buy/sell, leaving markets worse off. Professor Harris's study documents a relationship between minimum price variation and liquidity providers' willingness to display their trading interests.

There is additional empirical evidence to support this notion. Notice that in my study, quoted spreads for stocks trading between $3 and $5 *increased* following decimalization. *Quoted depths for these stocks, on the other hand, declined following the reduction. This* is consistent with Harris' argument in that individuals will be less willing to fully display their willingness to trade following decimalization. A study by Professor Joel Hasbrouck also provides similar evidence in support of Professor Harris's conjecture. Professor Hasbrouck notes that individuals are less likely to place limit orders (and thereby supply liquidity) in stocks which have a large relative. minimum tick (Le., stocks where the minimum tick as a percentage of price is large).[1]

This discussion highlights an important point. Market quality has more dimensions than simply the spread between the best bid and ask prices. Knowing how much depth is available in the market is another desirable attribute. Thus, we should not focus simply on the cost of trade; we must also consider that this added cost might generate added benefits, such as better information regarding the willingness of others to trade. These findings suggest that decreasing the minimum tick size may actually diminish market quality.

. *Cross-subsidization*: If liquidity providers are earning "too much" for providing liquidity, they may keep these added rents as profits. However, they might also use these gains to subsidize other, less-liquid issues. Professors Charles Cao, Hyuk Choe, and Frank Hatheway of the Pennsylvania State University wrote a paper entitled "Does the Specialist Matter? Differential Execution Costs and later-security Subsidization on the NYSE" (forthcoming in the *Journal of* finance) which finds evidence consistent with the notion that actively traded stocks subsidize inactively traded stocks. In other words, liquidity providers make excess profits on actively

traded stocks, but use this excess to improve tbe markets of less actively traded stocks. My study of tbe TSE finds that tbe bid-ask spread for stocks that were *not* affected by decimalization[2] actually *increased* significantly following the April 15, 1996 decimalization date. This is consistent with cross-subsidization since these stocks are less actively traded than those whose tick size was reduced. Thus, although decimalization reduced the trading costs in some stocks which experienced a decline in the minimum tick (specifically stocks greater than $5.00), there may have been a negative spillover effect on *other stocks*.

- *Cost of negotiating*: *Another* paper by Professor Harris ("Stock Price Clustering and Discreteness" in the *Review of Financial Studies*, 1991) argues that having a limited number of potential trading prices reduces the time it takes to negotiate. An extremely simple example would be if two individuals are given $1 .00 to split among themselves (which could reflect the total surplus the investors receive by trading). Allowing them to split tbe $1.00 on penny increments (or finer increments) would require them to negotiate, which takes time and effort. However. if they are only allowed to split the gains on, say, half-dollar increments, the individuals will more rapidly converge on SO.50 each (since any other agreement would provide no gain to one of the parties). A similar, though more complicated_ phenomenon occurs in financial transactions.[3]
- *Optimal Trading* ***Ranges: Although the minimum tick*** size is fixed in *dollar* terms, companies have some discretion over the *relative* or percentage tick size in that they control the price of the stock via stock splits. For example, some would argue that a one-eighth tick on a $2.00 stock is large in relative terms (i.e., it is $0.125/$2.00 = 6.25% of the price). However, a company could undergo a reverse stock split and increase its price, thereby reducing the relative minimum tick. In bis paper entitled, 'Tick Size, Share Prices, and Stock Splits" (forthcoming in the *Journal of Finance*), Professor James Angel of Georgetown University

argues that companies choose optimal trading ranges via stock splits. Most companies are aware of their optimal price range (i.e., the price that balances trading costs with liquidity) and act to stay within this range via splits. In the conclusion of bis paper, Professor Angel argues that reducing the tick size will lead to companies being forced to determine their *new* optimal trading range, a process which "...could take years, if not decades, as practitioners learn through experience where the new optimal trading range is." Tbis suggests that a reduction in the minimum tick may lead to additional adjustment costs while at the same time providing little or no additional benefits to market participants.

The above arguments suggest that decimalization need not have a positive impact on market quality, which may explain the reluctance of exchanges to abolish minimum ticks entirely.

However, even if individuals do not accept tbe above arguments as reasonable explanations for why there may be resistance to minimum tick size reductions, the argument that the exchanges are acting to protect member profits is less plausible. To see this, consider the soft drink example above. Let's say the board of directors of the lemonade stand refuses to allow the cost of a soft drink to be less than $1.00 at *their* soft drink stand. However, the other soft drink vendors opt against maintaining such a role, and instead charge a competitive price of $0.50. If all the stands provide an identical product, tbe stand with tbe $1.OO price limit will surely perish, unless they provide a product which justifies the higher price. Applying this to security markets, if a reduction in the minimum tick is really what investors want, it would be in the exchange's best interest to accommodate them. Otherwise, investors would shy away from utilizing that exchange, and instead look to other, more competitive markets. This, in turn, would lead companies to list on other exchanges to avoid the higher costs. Given the degree of competition across exchanges, it does not seem reasonable that an exchange would expose itself to such losses, unless it believed that it was necessary to keep a certain minimum tick size to avoid a reduction in market quality.

It should also be noted that the studies which investigated reductions in the minimum tick size. that I cited earlier au involved *voluntary* reductions. Thus, the results of the empirical research may not provide an unbiased gauge of what effect a mandated reduction in the minimum tick size will have on markets. In other words, given that these exchanges voluntarily chose to reduce their minimum tick size, they must have believed that market quality would be enhanced. Therefore, it is not surprising that the empirical analyses of such moves document benefits to reducing the tick because those moves that would reduce market liquidity are less likely to be observed (and studied). Furthermore, none of the studies involved analyzing eliminations of the minimum tick size. Thus, although some of the evidence suggests that decimalization with a concurrent reduction in the minimum tick size improved market quality, it is not fair to assume that this outcome would occur with a mandated reduction or elimination of the minimum tick size.

In summary, I believe that H.R. 1053 should be passed, causing exchanges to undergo a change which many believe to be inevitable. More importantly, it will allow markets to reassess its minimum tick size rules, and make changes where they deem necessary. I do not support a mandated reduction in the minimum tick size.

## Notes

[1] See "Using the TORQ Database," New York Stock Exchange working paper.
[2] The minimum tick size for stocks trading below $3.00 was not changed on April 15, 19% as were other stocks traded on the TSE.
[3] The cost of negotiation is also discussed in Brown, Laux, and Schachter, 'On the Existence of an Optimal Tick Size" in the *Review of Futures Markets*, 1991.